COMMONWEALTH OF AUSTRALIA

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CHARLES DARWIN UNIVERSITY

Family Name	
Given Names	
Student Number	
Teaching Period	Semester 2, 2015

FINAL EXAMINATION	**DURATION**
SBI105 – The Life of Cells	Reading Time: **10** minutes Writing Time: **180** minutes

INSTRUCTIONS TO CANDIDATES

1.1 The examination has 2 sections

Section A:
Suggested Time: 60mins Multiple Choice Questions: Answer ALL (50) questions
Marks: 50 Marks

Section B:
Suggested Time: 120mins Short Answer Questions: Answer ALL questions.
Marks as indicated per question

Section A must be answered on the Answer sheet provided and must be handed in with your answer booklet. Please ensure that your name and student number are clearly indicated on your Answer Sheet and at the top of this examination paper.

Section B is to be answered in a separate booklet

1.2 Note that questions ARE NOT of equal value.
1.3 Read ALL questions carefully.
1.4 Do not commence writing until instructed to do so

EXAM CONDITIONS

This is a CLOSED BOOK examination
Any non-programmable calculator is permitted
No handwritten notes are permitted
No dictionaries are permitted
Answer on the supplied examination material/s only

ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED
none	1 x 20 Page Book Faculty/School Multiple Choice Answer Sheet

THIS EXAMINATION PAPER AND SUPPLIED MATERIALS ARE NOT PERMITTED TO BE REMOVED FROM ANY EXAMINATION VENUE IN ANY CIRCUMSTANCE. THIS EXAMINATION IS PRINTED DOUBLE-SIDED.

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Section A
Multiple Choice Questions
Total Number of Marks for this section: Fifty (50)

This section should be answered on the Answer Sheet provided.
Each question is worth one (1) mark as indicated.
Suggested time allocation for this Section 60 mins.

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Section B
Total Number of Marks for this section: Ninety (90)

This section should be answered in the Booklet provided.
Each question is worth the number of marks indicated.
Please answer all parts (a-d) for all questions.
Suggested time allocation for Section B: 120 mins

Question 1

Each element has an atomic number and an atomic weight. For example, carbon has an atomic number of 6 and an atomic weight of 12. Explain the difference between these terms.

(3 marks)

Question 2

Draw and label a plant cell. Explain the function of **four** different organelles.

(9 marks)

Question 3

List **one** similarity and **three** differences between prokaryotic and eukaryotic cells.

(4 marks)

Question 4

Explain the importance of the limited permeability of the inner membranes of mitochondria.

(2 marks)

Question 5

What do the terms “hypo-osmotic’, “iso-osmotic” and “hyperosmotic” indicate?

(3 marks)

Question 6

Compare the structures and functions of DNA and RNA. What are the properties that allow them to be act as informational molecules?

(6 marks)

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Question 7

Where does glycolysis occur in a cell? How much ATP is produced from glycolysis compared with oxidative respiration?

(3 marks)

Question 8

What is considered central hub of all metabolisms? Please give a briefly description of this biological pathway.

(10 marks)

Question 9

From your knowledge of telomeres and telomerases, would you expect the offspring of Dolly, the sheep cloned from a somatic cell, to have normal or shortened telomeres?

(3 marks)

Question 10

Name three types of RNA and explain their function.

(6 marks)

Question 11

Ribosomes are critically important for translation. Indicate how the structure of a ribosome makes it so well suited for its function.

(6 marks)

Question 12

What is the relationship of a codon to an anticodon?

(3 marks)

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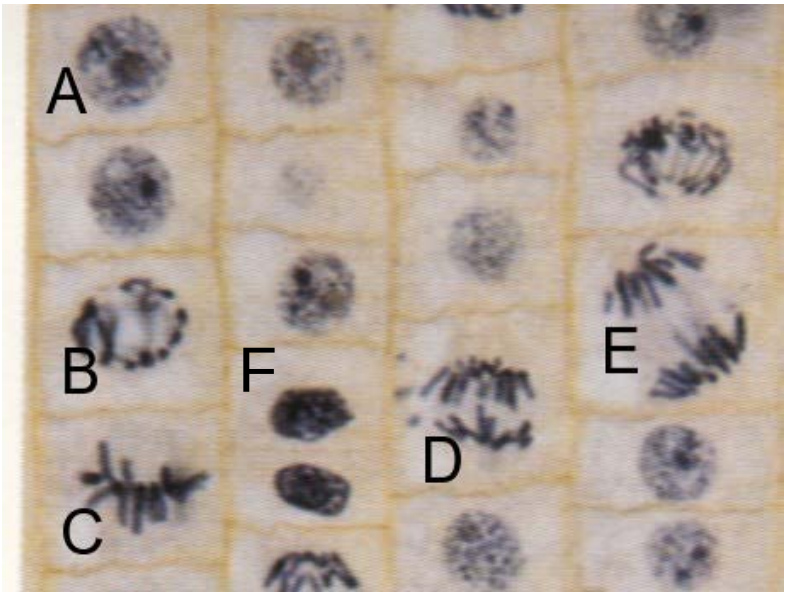
Question 13

Please put all the labelled cells (A, B, C, D, E and F) into order from the start of cell division to the end, indicate what phase each cell is in. Is this mitosis or meiosis?

(8 marks)



Question 14

Which cells undergo meiosis? What major events occur during Meiosis? What is the end result?

(5 marks)

Question 15

Describe the major function of two of the following,

- Epithelial tissue
- Connective tissue
- Muscular tissues
- Neural tissues

What kind of organism would you find these in?

(5 marks)

Question 16

Compare and contrast cytokinesis animal and plant cells?

(2 marks)

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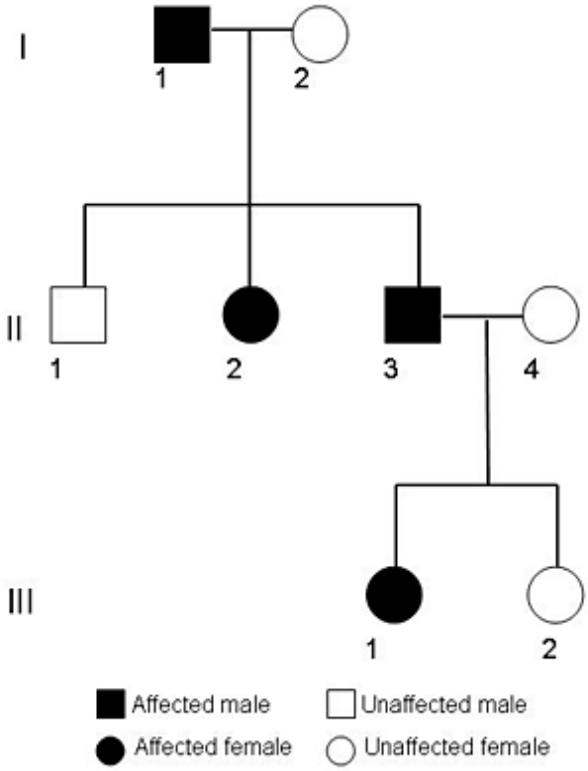
Question 17

Based on the family tree presented please answer the following questions.



a) What type of inheritance is this?

(1 mark)

b) Please indicate the genotypes for each person.

(4 marks)

Question 18

Compare and contrast neutral evolution and adaptive evolution using examples

(4 marks)

Question 19

What is the difference between a gene and an allele? Give an example.

(3 marks)

END OF THE EXAMINATION

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